

Application Number 10/825,965
Amendment responsive to Office Action mailed August 23, 2007

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AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

Claim 1 (Previously Presented): A method comprising:

- monitoring a signal that varies as a function of patient activity;
- periodically determining an activity level of the patient based on the signal;
- associating each of the determined activity levels with a therapy parameter set used by a medical device to deliver a therapy to a patient when the activity level was determined;
- determining a value of at least one activity metric for each of a plurality of therapy parameter sets based on activity levels associated with the therapy parameter sets, wherein determining a value of at least one activity metric comprises:
 - comparing each of the activity levels associated with the therapy parameter set to a threshold value; and
 - determining an average length of time that consecutively determined activity levels associated with the therapy parameter set were above the threshold.

Claim 2 (Original): The method of claim 1, wherein the signal comprises a signal generated by an accelerometer, the method further comprising filtering the signal to pass a band from approximately 0.1 Hz to approximately 10 Hz.

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Claim 3 (Previously Presented): The method of claim 1, wherein periodically determining an activity level comprises:

determining when the patient is awake; and
periodically determining an activity level while the patient is determined to be awake.

Claim 4 (Previously Presented): The method of claim 1, wherein determining a value of at least one activity metric comprises determining at least one of a mean or a median of activity levels associated with the therapy parameter set.

Claim 5 (Previously Presented): The method of claim 4, wherein determining a value of at least one activity metric comprises:

comparing the at least one of the mean or the median activity level to at least one threshold; and
selecting the activity metric value from a plurality of predetermined possible activity metric values based on the comparison.

Claim 6 (Previously Presented): The method of claim 1, wherein determining a value of at least one activity metric for a therapy parameter set comprises:

comparing each of the activity levels associated with the therapy parameter set to a threshold value; and
determining at least one of a percentage of time above the threshold or a percentage of time below the threshold.

Claim 7 (Cancelled)

Claim 8 (Original): The method of claim 1, wherein periodically determining an activity level comprises periodically determining a number of activity counts.

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Claim 9 (Previously Presented): The method of claim 8, wherein determining at least one activity metric value for each of a plurality of therapy parameter sets comprises determining an average number of activity counts per a unit of time for each of the plurality of therapy parameter sets based on the numbers of activity counts associated with the therapy parameter sets.

Claim 10 (Original): The method of claim 9, wherein determining an average number of activity counts per a unit of time comprises determining an average number of activity counts over a period of time substantially within a range from 10 to 60 minutes.

Claim 11 (Original): The method of claim 1, wherein periodically determining an activity level comprises periodically determining a value of at least one physiological parameter of the patient.

Claim 12 (Previously Presented): The method of claim 11, wherein periodically determining a value of a physiological parameter comprises periodically determining at least one of a heart rate, a respiration rate, respiratory volume, a core temperature, or a muscular activity level.

Claim 13 (Original): The method of claim 1, further comprising presenting a list of the plurality of therapy parameter sets and activity metric values associated with the therapy parameter sets.

Claim 14 (Original): The method of claim 13, further comprising ordering the list of therapy parameter sets according to the associated activity metric values.

Claim 15 (Previously Presented): The method of claim 14, wherein determining a value of at least one activity metric comprises determining a value of each of a plurality of activity metrics for each of a plurality of therapy parameter sets based on activity levels associated with the therapy parameter sets, and ordering the list comprises ordering the list according to a user selected one of the activity metrics.

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Claim 16 (Previously Presented): The method of claim 1, wherein determining a value of at least one activity metric further comprises:

determining a value of each of a plurality of activity metrics for each of the plurality of therapy parameter sets; and

determining a value of an overall activity metric for each of the plurality of therapy parameter sets based on the plurality of activity metric values.

Claim 17 (Original): The method of claim 1, further comprising presenting a graphical representation of the determined activity levels.

Claim 18 (Previously Presented): The method of claim 17, wherein presenting a graphical representation comprises presenting at least one of a trend diagram, a histogram, or a pie chart based on the determined activity levels.

Claim 19 (Original): The method of claim 1, wherein the medical device comprises an implantable medical device.

Claim 20 (Previously Presented): The method of claim 19, wherein the implantable medical device comprises at least one of an implantable neurostimulator, or an implantable drug pump.

Claim 21 (Original): The method of claim 1, wherein the medical device comprises a trial neurostimulator.

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Claim 22 (Previously Presented): A medical system comprising:

a medical device that delivers a therapy to a patient; and

a processor that monitors a signal that varies as a function of patient activity, periodically determines an activity level of the patient based on the signal, associates each of the determined activity levels with a therapy parameter set used by the medical device to deliver the therapy to the patient when the activity level was determined, and determines a value of at least one activity metric for each of a plurality of therapy parameter sets based on activity levels associated with the therapy parameter sets,

wherein for each of the plurality of therapy parameter sets, the processor compares each of the activity levels associated with the therapy parameter set to a threshold value, and determines as an activity metric value for the parameter set an average length of time that consecutively determined activity levels were above the threshold.

Claim 23 (Original): The medical system of claim 22, wherein the medical device includes the processor.

Claim 24 (Original): The medical system of claim 22, further comprising a programming device that includes the processor.

Claim 25 (Original): The medical system of claim 22, wherein the signal comprises a signal generated by an accelerometer, and the medical device filters the signal to pass a band from approximately 0.1 Hz to approximately 10 Hz.

Claim 26 (Previously Presented): The medical system of claim 22, wherein the processor determines when the patient is awake, and periodically determines an activity level of the patient while the patient is determined to be awake.

Claim 27 (Previously Presented): The medical system of claim 22, wherein, for each of the therapy parameter sets, the processor determines at least one of a mean or a median of activity levels associated with the therapy parameter set.

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Claim 28 (Previously Presented): The medical system of claim 27, wherein, for each of the therapy parameter sets, the processor compares the at least one of the mean or the median activity level to at least one threshold, and selects another activity metric value from a plurality of predetermined possible activity metric values based on the comparison.

Claim 29 (Previously Presented): The medical system of claim 22, wherein, for each of the therapy parameter sets, the processor compares each of the activity levels associated with the therapy parameter set to a threshold value, and determines as another activity metric value for the therapy parameter set at least one of a percentage of time above the threshold and a percentage of time below the threshold.

Claim 30 (Cancelled)

Claim 31 (Original): The medical system of claim 22, wherein an activity level comprises a number of activity counts.

Claim 32 (Previously Presented): The medical system of claim 31, wherein another activity metric value for each of the therapy parameter sets comprises an average number of activity counts per a unit of time.

Claim 33 (Original): The medical system of claim 32, wherein the unit of time is substantially within a range from 10 to 60 minutes.

Claim 34 (Previously Presented): The medical system of claim 22, wherein the processor periodically determines an activity level by periodically determining a value of at least one physiological parameter of the patient.

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Claim 35 (Previously Presented): The medical system of claim 34, wherein the processor periodically determines at least one of a heart rate, a respiration rate, a respiratory volume, a core temperature, or a muscular activity level.

Claim 36 (Original): The medical system of claim 22, further comprising a display to present a list of the plurality of therapy parameter sets and activity metric values associated with the therapy parameter sets.

Claim 37 (Original): The medical system of claim 36, further comprising a programming device that includes the display.

Claim 38 (Original): The medical system of claim 37, wherein the programming device orders the list of therapy parameter sets according to the associated activity metric values.

Claim 39 (Original): The medical system of claim 38, wherein the processor determines a value of each of a plurality of activity metrics for each of the plurality of therapy parameter sets based on activity levels associated with the therapy parameter sets, and the programming device orders the list according to a user selected one of the activity metrics.

Claim 40 (Original): The medical system of claim 36, wherein the medical device includes the display, and the processor generates the list and presents the list via the display.

Claim 41 (Original): The medical system of claim 22, wherein the processor determines a value of each of a plurality of activity metrics, and determines a value of an overall activity metric based on the plurality of activity metric values.

Claim 42 (Original): The medical system of claim 22, further comprising a programming device that includes a display, wherein the programming device presents a graphical representation of the activity levels determined by the medical device via the display.

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Claim 43 (Previously Presented): The medical system of claim 42, wherein the programming device presents at least one of a trend diagram, a histogram, or a pie chart via the display based on the activity levels determined by the medical device.

Claim 44 (Original): The medical system of claim 22, wherein the medical device comprises an implantable medical device.

Claim 45 (Previously Presented): The medical system of claim 44, wherein the implantable medical device comprises at least one of an implantable neurostimulator or an implantable drug pump.

Claim 46 (Original): The medical system of claim 22, wherein the medical device comprises a trial neurostimulator.

Claim 47 (Previously Presented): A medical system comprising:

- means for monitoring a signal that varies as a function of patient activity via a medical device that delivers a therapy to a patient;
- means for periodically determining an activity level of the patient based on the signal;
- means for associating each of the determined activity levels with a therapy parameter set that was used by a medical device to deliver a therapy to a patient when the activity level was determined;
- means for determining a value of an activity metric for each of a plurality of therapy parameter sets based on activity levels associated with the therapy parameter sets; and
- means for presenting a list of the plurality of therapy parameter sets and activity metric values associated with the therapy parameter sets.

Claim 48 (Original): The medical system of claim 47, further comprising means for ordering the list according to the activity metric values.

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Claim 49 (Original): The medical system of claim 48, further comprising means for determining a value of each of a plurality of activity metrics for each of a plurality of therapy parameter sets based on activity levels associated with the therapy parameter sets, wherein the means for ordering the list comprises means for ordering the list according to a user selected one of the activity metrics.

Claims 50-68 (Cancelled)

Claim 69 (Original): A computer-readable medium comprising instructions that cause a programmable processor to:

- receive information identifying a plurality of therapy parameter sets and associated activity levels from an implantable medical device;

- determine a value of an activity metric for each of a plurality of therapy parameter sets based on activity levels associated with the therapy parameter sets; and

- present a list of the plurality of therapy parameter sets and activity metric values associated with the therapy parameter sets.

Claim 70 (Previously Presented): The medium of claim 69, wherein the instructions that cause the processor to determine a value of an activity metric comprise instructions that cause the processor to, for each of the therapy parameter sets, determine at least one of a mean and a median of activity levels associated with the therapy parameter set.

Claim 71 (Original): The medium of claim 70, wherein the instructions that cause the processor to determine a value of an activity metric comprise instructions that cause the processor to, for each of the therapy parameter sets:

- compare the at least one of the mean and the median activity level to at least one threshold; and

- select an activity metric value from a plurality of predetermined possible activity metric values based on the comparison.

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Claim 72 (Original): The medium of claim 69, wherein the instructions that cause the processor to determine a value of an activity metric comprise instructions that cause the processor to, for each of the therapy parameter sets:

compare each of the activity levels associated with the therapy parameter set to a threshold value; and

determine as the activity metric value for the therapy parameter set at least one of a percentage of time above the threshold and a percentage of time below the threshold.

Claim 73 (Original): The medium of claim 69, wherein the instructions that cause the processor to determine a value of an activity metric comprise instructions that cause the processor to, for each of the plurality of parameter sets:

compare each of the activity levels associated with the therapy parameter set to a threshold value; and

determine as the activity metric value for the parameter set an average length of time that consecutively determined activity levels were above the threshold.

Claim 74 (Original): The medium of claim 69, wherein an activity level comprises a number of activity counts, the instructions that cause the processor to determine a value of an activity metric comprise instructions that cause the processor determine an average number of activity counts per a unit of time.

Claim 75 (Original): The medium of claim 69, further comprising instructions that cause the processor to order the list of therapy parameter sets according to the associated activity metric values.

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Claim 76 (Original): The medium device of claim 75,
wherein the instructions that cause the processor to determine a value of an activity metric comprise instructions that cause the processor to determine a value of each of a plurality of activity metrics for each of the plurality of therapy parameter sets based on activity levels associated with the therapy parameter sets,
the medium further comprising instructions that cause the processor to:
receive a selection of one of the activity metrics from a user; and
order the list according to the user selected one of the activity metrics.

Claim 77 (Currently Amended): A method comprising:
monitoring a signal that varies as a function of patient activity;
periodically determining an activity level of the patient based on the signal;
associating each of the determined activity levels with a therapy parameter set used by a medical device to deliver a therapy to a patient when the activity level was determined;
for each of the therapy parameter sets, determining at least one of a mean or a median of activity levels associated with the therapy parameter set; set;
comparing the at least one of the mean or the median activity level for each of the therapy parameter sets to at least one threshold; and
selecting an activity metric value for each of the therapy parameter sets from a plurality of predetermined possible activity metric values based on the comparison.

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Claim 78 (Previously Presented): A medical system comprising:
a medical device that delivers a therapy to a patient; and
a processor that monitors a signal that varies as a function of patient activity, periodically determines an activity level of the patient based on the signal, associates each of the determined activity levels with a therapy parameter set used by the medical device to deliver the therapy to the patient when the activity level was determined, for each of the parameter sets, determines at least one of a mean or a median of activity levels associated with the therapy parameter set, compares the at least one of the mean or the median activity level for each of the therapy parameter sets to at least one threshold, and selects an activity metric value for each of the therapy parameter sets from a plurality of predetermined possible activity metric values based on the comparison.

Claim 79 (Previously Presented): A method comprising:
monitoring a signal that varies as a function of patient activity;
periodically determining an activity level of the patient based on the signal;
associating each of the determined activity levels with a therapy parameter set used by a medical device to deliver a therapy to a patient when the activity level was determined;
determining a value of at least one activity metric for each of a plurality of therapy parameter sets based on activity levels associated with the therapy parameter sets; and
presenting a list of the plurality of therapy parameter sets and activity metric values associated with the therapy parameter sets.

Claim 80 (Previously Presented): The method of claim 79, further comprising ordering the list of therapy parameter sets according to the associated activity metric values.

Claim 81 (Previously Presented): The method of claim 80, wherein determining a value of at least one activity metric comprises determining a value of each of a plurality of activity metrics for each of a plurality of therapy parameter sets based on activity levels associated with the therapy parameter sets, and ordering the list comprises ordering the list according to a user selected one of the activity metrics.

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Claim 82 (Previously Presented): The method of claim 79, wherein periodically determining an activity level comprises:

determining when the patient is awake; and
periodically determining an activity level while the patient is determined to be awake.